ARC
Advanced Research Center

The Advanced Research Center (ARC) serves as the U.S. Army Space and Missile Defense Command's (SMDC) research and development facility for missile defense (MD) research. It is the command's principal center for developing and integrating complex MD systems and a simulation support facility for the MD community. The ARC supports the Missile Defense Agency (MDA), the Army Program Executive Office for Air, Space and Missile Defense (PEO-ASMD), the Ground-Based Midcourse Defense (GMD) Joint Program Office, and the High Performance Computing Modernization Program (HPCMP). The ARC uses its 90,000 square feet of laboratory, computer room, and office space to provide resident programs with the following capabilities.

Capabilities

The ARC supports all phases of concept and weapon system development to include requirements related to evaluation, testing, and training. Its capabilities include:

- High-Performance Computing
- Networking Engineering/Communications
- Testbed Development
- Software Engineering
- Hardware/HWIL Integration
- User Services

High Performance Computing: The ARC is an HPCMP Distributed Center partner. ARC hardware supports serial processing, vector processing, and massively parallel processing with more than 1,000 computer systems, ranging from graphic workstations to high-end servers and high performance super computers.

Network Engineering and Communications: The ARC is interconnected through extensive network and communication architectures to numerous local and remote facilities. There are more than 95 Local Area Networks (LAN) and Wide Area Networks (WAN). These include secure high-speed connectivity to the research, development, test, and engineering communities via the Defense Research and Engineering Network (DREN) and the Secret DREN (SDREN). The ARC is a major hub-site for the Missile Defense Agency Network (MDANet). The ARC infrastructure provides LAN and WAN connectivity through state-of-the-art networking capability that is managed and configured to meet requirements. TCP/IP is the main internal protocol supported over Ethernet 10/100/1000 megabit medium. Virtual LAN capability with WAN access to a wide range of DoD resources and users is provided along with sophisticated network access and firewall protection to provide a secure network environment.

Testbed Development: The ARC has responded to the changing requirements within DOD for diverse missile defense programs. Each testbed has its own unique requirements for space (laboratory and/or computer room), computer resources (dedicated and/or shared), network/connectivity, and security (classified or unclassified). Virtually all ARC customers are satisfied with the responsiveness to their changing requirements across all of these disciplines. The ARC currently provides testbed support for MDA and SMDC programs that include:

- Integrated System Test Capability 1 & 2
- Extended Air Defense Testbed
- Israeli Testbed
- Sensor Simulation Testbed
- X-Band Radar Testbed
- Joint Users Lab
- Operational Test Agency
- Synthetic Battlefield Center
- Jet Interaction
- Test Evaluation, Data Acquisition, & Communications
- Strategic T & E Planning and Analysis Lab
- BMDS Hardware-in-the-Loop

Software Engineering: The ARC Software Engineering Department is staffed with highly trained professional software and database engineers. Their fields of expertise range from computer system administrative support, programming, systems integration, communications, graphic development skills, modeling and simulation experience, advanced battlefield software expertise, and Web development.

Hardware and Hardware-in-the-Loop Integration: Hardware integration includes facility design, cable plant design, installation, computer hardware integration, hardware-in-the-loop (HWIL) installation, and audio/visual design and integration.

User Services: User support is provided for real-time problem solving and programmer assistance through on-site systems and network analysts. Help desk support, establishing user accounts, and all ARC service requests are supported from this "one-stop-shopping" operation.

The ARC's cost-effective capability offers significant computer and network resources and a staff of information technology (IT) expertise.

- Programs benefit from centralized economy of scale
- Reduced cost of technology and facilities infrastructure
- Access to critical skills is available for all users
- There is a synergistic effect with various programs that are working similar missile defense issues in the same facility.

The ARC serves both as a principal node for integrating complex missile defense simulations and as a command asset of SMDC for space and missile defense research.

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